The Digital Enterprise
EWA – Electronics Works
Amberg
Site Amberg
Plants and Products

SIMATIC
PLC - Programmable Logic Controller
DP - Decentral Periphery
HMI - Human Machine Interface

SIRIUS
Contactors
Circuit board assembly/Electronic Products
Push buttons and signal columns
Production metal parts and assembly groups

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Excellence in Manufacturing – For our Customers

Our Mission

“Be the Role Model for Excellence in Manufacturing to provide proven Value Add for our Customers and Business Unit, based on the methods of Digital Enterprise and Lean Industrial Engineering.”

Shape the Digital Future. Together.

Dr. Gunter Beitinger, Vice President Manufacturing

Our Locations

VA contribution by Location

- 67%
- 15%
- 6%
- 12%
(~ 85% in Germany)

SEWC Chengdu (China)
SE MF Fürth (Germany)
Non FA (90% Germany)

Number of MF Employees

1250
390
200
SEWC
SE MF
EWA
Non FA

Our Vision

Drive Digital Enterprise
World Class Products
Strategic Holistic Partnerships
Social Responsibility and Culture
Global Value Add Structures
Highest Quality and Efficiency

Perfection for our Customers

MF Vision and Strategy 2029
EWA & SEWC
Produkte des EWA – SIMATIC

Programmierbarer Logik-Controller **SIMATIC S7**

Dezentrales IO System **SIMATIC ET 200**

Bedien- und Beobachtungssysteme **SIMATIC HMI**
Industrie 4.0: The Vision of the Future of Manufacturing

Electronic Works Amberg
~1,260 Employees
>15 Mio. Products per year
≥1 Product per Second
>60,000 Customers worldwide
Quality level of >99,9989%
Digitalization changes everything
The Answer to the Question: „How can I become a smart factory?“

- Automation
  - Automated Production
  - Smart Line Concepts
  - Industrial Engineering
  - Plug & Communicate Specification

- Digitalization
  - Digital Lifecycle Readiness
  - Horizontal and Vertical Integration
  - Identification and History for all Elements
  - Smart Data Management

- Organization
  - Manual/ LCA Production
  - Standardized Work Instructions
  - Ergonomic Workstation Design
  - Focus on Tact Time
The Totally Integrated Automation portfolio for factory automation

Enterprise Level
- ERP
- PLM

Management Level
- MES

Operator Level
- SCADA

Control Level
- SIMATIC Controllers
- SIMATIC HMI
- SIMATIC Distributed I/O

Field Level
- SIRIUS Industrial Controls
- SIMATIC IDENT Industrial Identification
- SINAMICS Drive Systems

Enterprise Level Tools:
- NX Product Development
- TEAMCENTER Collaborative PDM
- TECNOMATIX Digital Manufacturing

Totally Integrated Automation Tools:
- SIMATIC IT Production Suite
- SIMATIC IT R&D Suite
- SIMATIC IT Intelligence Suite

Plant Cloud Services

Totally Integrated Automation Framework:
- TIA PORTAL Engineering Framework for Automation Tasks
Essential requirements – throughout the manufacturing industry

Speed

Flexibility

Quality

Efficiency

Security
Integrating and digitalizing the entire value chain is key to staying competitive in the future.
Creating a Digital Twin of the entire value chain is key to staying competitive in the future.
And only the holistic automation approach…
…can cover all Industrie 4.0 requirements
## Customer Challenge

**„Digital Twin”**

Integration of digital and real world of product and production

## PLM Portfolio

- Seamless data flow from product idea to production
- Consistent data management for all PLM tools
- Leverage Big Data to gain insights into complex, global processes
Siemens: Realization of our own Digital Factory
Electronics Works Amberg: Reducing time-to-market

Shorter innovation cycles
More complex products
Bigger but smarter data volumes

- ~ 5,000 work plan changes per year (> 20% due to component discontinuation)
- > 120 variations are built per day based on 75% automation
- ~ 50 million process & product items entered per day
Siemens: Realization of our own Digital Factory
Electronics Works Amberg: Enhancing flexibility

- Mass customization
- Volatile markets
- Highest productivity

- ~ 350 changeovers per day to handle more than 1,000 different products
- > 99.5% delivery reliability to assure 24h delivery time
- ± 20% personal capacity flexibility to meet customer demand on time
Ensure stable quality

- Decreased production failure
- Increased product quality

- Production process defect dropped to 11dpm (99.9989% built in quality)
- Field return rate decreased by 79% in last decade
Siemens: Realization of our own Digital Factory
Electronics Works Amberg: Increasing efficiency

Increasing efficiency

- Optimal capacity utilization
- Efficient resource utilization

- > 75% line utilization to serve 60,000 customers
- ~ tenfold of shop floor utilization till start of production (1990) equals 1pc./sec.
Siemens: Realization of our own Digital Factory
Electronics Works Amberg: Security in production

Security in production

- System Protection
- Network Protection
- Plant Protection

- Secure production environment:
  - separated networks for production
  - secure cell principle in use
- Protection level 3 in selected areas
- Integrity: The software we developed is exactly what is in your product!
- Regularly Security Awareness training
Perfection and Productivity through Automation @ EWA

More than 75% Automation
- Production
- Material- and
- Information flow

More than 1,000 SIMATIC applications
Electronics Works Amberg
Consistency from design to production

PLM Software (NX)

Teamcenter

Routing

Simatic IT

Supplier

Material forecast
Automatic order

Production order
Capacity
Inventory Mgmt.

Delivery

Customer

NC-Programmgenerator
Legacy Systems

Relevant product data information
Intelligent preprocessing

Ressource Routing

BOM

Process interlocking
Traceability
Serial number report
Test protocol

Recipe

Surface mounting technology line

Templates
SMT
SPI
ACI
ICT / FP

X-Ray
THT
Labels
IFT
Inspection

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A maximum of transparency for logistics and quality

Record big data and push smart data

Identification of all objects and process
- All products, parts,…
- All machines, adapters
- All programs, data,…

Record of all process values
- Soldering temperature
- Pass or fail
- Torque …

Autonomous process analysis
- Real-time
- All employees
- All processes
Gapless monitoring of the entire value chain

Big data to smart data

- Intuitive drilldown
- Analyzing and management information
- Watchdog and push mails

Two mouse clicks from plant view to unicum
Our employees are integrated into the Digital Factory

Fully digital supported work

- Test instruction/Data Collection
- Packaging
- Label Printing
- History
- Monitoring Pack parts
- Product provision
- Scanning
- Selection: CV, Test instruction
- Check & collect
- History check
- Monitoring packing list
- Conditions satisfied
- Label Printing
- Entry in history
Success through quality

Perfection for our customers

![Graph showing dpm-A values for different years]

- 90/91: 580
- 91/92: 380
- 92/93: 280
- 93/94: 180
- 94/95: 130
- 95/96: 90
- 96/97: 60
- 97/98: 30
- 98/99: 20
- 99/00: 10
- 00/01: 5
- 01/02: 3
- 02/03: 2
- 03/04: 1
- 04/05: 0
- 05/06: 0
- 06/07: 0
- 07/08: 0

Yearly dpm-A values:
- 08/09: 19
- 09/10: 17
- 10/11: 16
- 11/12: 14
- 12/13: 12.5
- 13/14: 11.5
Success through logistics performance

Highest Quality and Efficiency

Delivery items [mio.]

Logistic performance [1. BLT]
The Answer to the Question:
„Why should I become a smart factory?“

REALITY
SIMULATION
PLANING

... to increase “-abilities”!

Measure -Ability
Information Gathering

Interpretation -Ability
Pattern Recognition

Prognostication -Ability
Stabilization

Decision -Ability
Adaptation

Observe
Analyze
Predict
Prevent

Reactive
Proactive
# Industrial Data Management Example

Energy Management with SIMATIC

<table>
<thead>
<tr>
<th>Observe</th>
<th>Analyze</th>
<th>Predict</th>
<th>Prevent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measure-Ability</strong></td>
<td><strong>Interpretation-Ability</strong></td>
<td><strong>Prognostication-Ability</strong></td>
<td><strong>Decision-Ability</strong></td>
</tr>
<tr>
<td>... of Energy data</td>
<td>... of Energy consumption</td>
<td>... of Energy hot spots</td>
<td>... Energy management</td>
</tr>
</tbody>
</table>

**Field Level**
- ET200-Energy meter, SIRIUS
- SIMOCODE, SENTRON PAC, ...
- Energy Box

**Control Level**
- S7-1200, S7-1500, S7-300
- Basic Panels, Comfort Panel, ...
- TIA Portal
- WinCC V12, STEP7 V12

**Operator Level**
- S7-300, S7-400, Industrial PC
- SIMATIC WinCC V7, PCS7, SIMATIC powerrate
- PROFenergy

**Management Level**
- SIMATIC B.Data (On-Site)
- Energy Analytics (als Managed Service)

**Observe**
- **Analyze**
- **Predict**
- **Prevent**
- Observe
- Analyze
- Predict
- Prevent

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Industrial Data Management Example
Logistic Management with SIMATIC

Observe
Automation-Ability… of Logistic Systems
Field/Control Level
S7-1200, S7-1500, S7-300,
ET200S SP; Basic Panels, Comfort
Panel, …

Analyze
Interpretation-Ability… of Logistic Systems
Operator Level
WinCC

Predict
Prognostication-Ability… of Logistic behavior
Operator Level
Plant Simulation

Prevent
Decision-Ability… Logistic Planning
Management Level
Preactor
Siemens: Realization of our own Digital Factory
Electronics Works Amberg
Thank You!
Information and Rules

Brochures in the foyer

Personal protective equipment for shopfloor visits, if required:

- 1 stripe per person
- Button up the coats

Don’t interfere with running machines and systems!